

EXHIBIT I

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March 13, 2006

Mr. Paul R. Robinson
Meyer Darragh Buckler Bebenek & Eck
U.S. Steel Tower – Suite 4850
600 Grant Street
Pittsburgh, PA 15219

Re: Lindquist, Tina v. Heim, L.P.
Your file no.: ALFA-107530

Dear Mr. Robinson:

In accordance with your request, I have completed my review of the documents provided by your office and summarize my opinions and conclusions relative to the foot control provided by Heim for use with the Mechanical Press Brake involved in Tina Lindquist's accident on September 25, 2002.

Documents Reviewed

1. Complaint in Civil Action
2. OSHA Investigation file
3. Instructions and Parts Book for Heim Mechanical Press Brakes
4. Sales documentation for the Heim Press Brake
5. Corry Manufacturing Accident report file
6. Deposition testimony
 - a. Tina Lindquist, taken on June 28, 2005
 - b. Gary Dietz, taken on July 21, 2005
 - c. Gary Merkle, taken on July 21, 2005
 - d. Kevin Messinger, taken on July 21, 2005
 - e. Jan Oviatt, taken on July 22, 2005
 - f. Dave Phillips, taken on July 22, 2005
 - g. Joel Nichols, taken on July 22, 2005
 - h. Anthony Mase, Jr., taken on July 27, 2005
 - i. Robert Rooney, taken on September 8, 2005
 - j. Jamie Ossa, taken on September 8, 2005
 - k. Zygmund Zajdel, taken on January 23, 2006

7. Post-accident photographs and videotape of the Heim Press Brake and tooling
8. Interrogatories and Responses
9. Document Production Requests
10. PA-OSHA Consultation Program file
11. PMA Insurance claims notes
12. Codes and Standards
 - a. Safety Requirements for Power Press Brakes, ANSI B11.3- 1973, 1982 and 2002
 - b. Safety Requirements for Mechanical Power Presses, ANSI B11.1-1971 and 1982
13. Linemaster Switch Corp.
 - a. current product literature
 - b. patent no. 2,957,960
14. Safety Literature
 - a. Philosophical Aspects of Dangerous Safety Systems; Barnett and Hamilton; December, 1982
 - b. Safeguard Evaluation Protocol; Barnett and Schmid; May, 1995
 - c. Foot Controls – Riding the Pedal; Barnett; July, 1997
 - d. Foot Control Activation – Reciprocating vs. Pivoting; Barnett and Barroso; September, 1998
 - e. Safeguarding Workers and Protecting Workers from Amputations; U.S. Department of Labor, OSHA 3170, 2001

Accident Description

On the day of the accident, Tina Lindquist was employed at Corry Manufacturing in Corry, Pennsylvania as a press operator. She was assigned to operate the Heim power press brake, model 70-6, serial no. 2176, using a hands-in-die parts feeding and removal procedure. The press brake was equipped with a dual hand control as well as an electric foot control. The operating method was selected through the use of a supervisory key lock selector switch mounted on the dual hand control pedestal. The foot control activation method was selected and in use at the time of the injury.

Ms. Lindquist indicated she was not aware the dual hand control was available for use on the subject press brake nor was she trained to avoid reaching into the point of operation of the press. She stated she was specifically instructed to reach into the point of operation region to pre-form the workpiece around a mandrel before actuating the foot control. Indeed, reaching into the point of operation region was the only way to introduce the work into the tooling of the press.

Ms. Lindquist had a chair available to her while operating the press brake and was found seated on the chair following the accident. From her operating position at the chair, Ms. Lindquist was able to reach into the press. The foot control was positioned on the floor in front of her to the right such that she was able to access it from her operating position using her right foot.

While hand forming the workpiece on the mandrel, Ms. Lindquist activated the foot control causing the press brake to cycle and crushing her fingers.

Foot Control Identification

It is understood that the foot switch control in use at the time of Mrs. Lindquist's accident was lost or disposed of following the sale of the Heim press brake by Corry Manufacturing after the accident.

According to the file documentation, the foot control originally supplied with the Heim press brake cannot be determined. However, it appears that the foot control in use at the time of the accident had a Linemaster Hercules Full Shield protecting the pedal from the top and both sides. The Full Shield is clearly shown in several photographs taken after the accident occurred. However, it is unclear whether the foot control shown in the post-accident photographs is a Linemaster product. To my knowledge, Linemaster Hercules pedals and shields, regardless of style, were painted orange. The pedal depicted beneath the shield in the photographs appears to be black.

Dave Phillips, a witness employed in Corry Manufacturing's maintenance department, indicated there are different colors of foot switches in use at Corry. There were black foot switches for the alloy machines and orange ones for the presses:

Phillips, pg. 92 to 93:

- Q. Are there any other different colors of foot switches in place at Corry?
- A. For certain machines, yes.
- Q. What other colors are there?
- A. There's little black ones for like alloy machines.
- Q. How about for the presses?
- A. They're all orange.

Hence, it is inconclusive whether the foot control assembly depicted in the photographs is a genuine Linemaster product or, perhaps, a hybrid of two different foot switch products.

On the other hand, Corry witnesses as well as the report prepared by Barnett and Ulmenstine identify a foot control equipped with a maintained latch mechanism. This feature requires full insertion of the users foot into the pedal housing to push the latch forward with the toe before the pedal can be depressed. Linemaster patented this feature in 1960 and, to my knowledge, manufactures the only foot switch with this safety feature. This foot control, currently called the "Hercules Anti-Trip Footswitch Full Shield Model"¹ is intended to help prevent accidental actuation.

Acceptance of the Model 532-SWH Foot Control in Safety Standards

The first safety standard that specifically addressed mechanical power press brakes was adopted in 1973, revised in 1982, reaffirmed twice, and revised again in 2002. The standard is identified as ANSI B11.3, *American National Standard for Machine Tools – Power Press Brakes – Safety Requirements for Construction, Care, and Use*.

In the report authored by Barnett and Ulmenstine, the claim is made that ANSI B11.3-1973 “is the first ANSI standard developed for press brakes. As such, it only addressed mechanical foot pedals.” This claim is not accurate.

Not only does the standard recognize both mechanical and electric foot operating means, it provides terminology to distinguish each type. Note the published definitions of “Foot Control” and “Foot Pedal” in the 1973 standard²:

3.23 Foot Control. A foot control is the foot-operated control mechanism (other than foot pedal) designed to control the movement of the ram on mechanical, hydraulic, or special-purpose power press brakes.

E3.23 Foot Control. This control usually takes the form of an electrical switch that operates a solenoid or solenoid valve.

3.24 Foot Pedal. A foot pedal is the foot-operated lever designed to operate the mechanical linkage that directly engages the clutch and disengages the brake on a mechanical power press brake while the pedal is held depressed.

The 1973 safety standard required that the foot control be protected against inadvertent actuation³:

4.3.4.3 Foot Control. A foot control, if used, shall be protected so as to inhibit accidental actuation by falling or moving objects, or by someone stepping on it.

A guard covering the top of the pedal pad was sufficient to comply with this requirement. Note that the code committee addressed the hazard of accidental actuation by using the language “stepping on” the pedal rather than “stepping into the pedal.” Note that the only foot control illustration in the 1973 safety standard (Illustration 15)⁴ shows an open front pedal design.

A foot control equipped with a top and side guarding arrangement, the equivalent to Linemaster's "Full Shield," is illustrated in the 1982⁵ and 2002⁶ revisions of the ANSI B11.3 safety standard.

A Linemaster "Full Shield" foot control is illustrated in the U.S. Department of Labor publication OSHA 3170, *Safeguarding Workers and Protecting Workers from Amputations*.⁷ The foot control has no front lift gate and the illustration is captioned, "Properly Guarded Foot Control." Equally significant is the statement:

"Foot controls must be guarded to prevent accidental activation by another worker or by falling material and not allow continuous cycling. They work best when the operator is in a sitting position. Always avoid the hazard of riding the pedal (keeping the foot on the pedal while not actively depressing it.)"

Note that OSHA does not require the foot control to prevent accidental activation by the foot control user, but rather "by another worker." It is correctly recognized that since the intended use of this control involves the user depressing the pedal, it is not possible to prevent the same person from inadvertently stepping into it.

The foot control involved in Ms. Lindquist's accident had two additional features to protect against inadvertent actuation of the pedal. The pedal was equipped with side guards as well as a toe latch feature that required the operator to fully insert their foot into the pedal guard and push a toe latch rearward before the pedal could be depressed. This safety feature exceeds any requirement for protection against inadvertent actuation expressed by any safety standard, past or present.

The 2002 safety standard for press brakes additionally recognizes the hazard associated with unattended actuation of the foot operating means. The supervisory key lock switch on the operator's control pedestal fulfills this requirement. When the press brake is unattended, the foot control can be disabled by turning the key in the control pedestal and removing it from the selector.

The Modern Foot Control vs. the Mechanical Foot Pedal

As Barnett and Ulmenstine point out in their report, the mechanical foot pedal of years past is characterized by locations close to the bed of the press, large activation resistance, and large pedal movements.

The modern foot control in use at the time of the accident was tethered on a long cord estimated to be 10 to 12 ft in length. This enables the foot control to be located at a "Safe Distance" from the press. In other words, if the press is utilized with no other point of operation guarding, the foot control can be located sufficiently far from the hazard that the press operator cannot reach the hazard from the operating position. In the case of a press

brake, the long cord also enables the foot control to be utilized while handling large work pieces that prevent the operator from being positioned near the bed of the press. The older style of mechanical foot pedal cannot accommodate this need.

The large activation resistance and pedal height associated with the mechanical foot pedal restricts the use of this device to standing operators. Balancing on one foot is required when activating a control of this nature, not to mention the operator fatigue associated with multiple activations over many hours of press brake work. As OSHA 3170 has correctly pointed out, the electric foot control works best when the operator is in a sitting position. The sitting position all but eliminates the problem of balancing oneself on one foot and reduces the physical fatigue associated with high pedal activation forces and large pedal movements. The electric foot control can also be utilized by a standing as well as a seated operator. It is simply a more versatile control means.

There are acceptable applications for both the electric foot control as well as the mechanical foot pedal. Only the press user is capable of making an appropriate decision regarding which style of control is the best and safest to use for a given production run.

Neither the mechanical foot pedal nor the electric foot control were adequate, by themselves, to satisfy the power press brake safety standard given the tooling and operating arrangement chosen by Corry Manufacturing at the time of Ms. Lindquist's injury. Additional point of operation guarding was needed, and required, to adequately protect Ms. Lindquist.

Foot Switch Utilized at the Time of the Accident

In their report, Barnett and Ulmenstine make reference to the footswitch in use at the time of the accident. They describe a Linemaster product

“...constructed with an antitrip treadle mechanism, a latch that requires a certain foot insertion into the switch to depress the pedal.”

This product could not have been the Linemaster Model 532-SWH originally supplied with the Heim press since the 532-SWH was not equipped with the antitrip treadle mechanism and latch trip lever. The Model 532-SWH was protected with a Full Shield covering the top and both sides of the treadle only. Indeed, according to Heim engineering drawing A-470-D, the anti-trip foot controls with latch trip lever (Linemaster Models 511-B2 and 511-B4) were not utilized by Heim until after November 9, 1982, four years after the date of manufacture of the product involved in the accident.

The Proposed Front-Gated Foot Control

Plaintiff's experts, Barnett and Ulmenstine, have proposed that a foot control with a front gate be utilized in an effort to avoid inadvertent tripping of the foot control.

Although research conducted on foot controls concludes that a front gate further reduces the probability of an inadvertent foot insertion, the same research also demonstrates that a critical undesirable "side effect" is created by the presence of the lift gate. In his July, 1997 publication, *Foot Controls: Riding the Pedal*⁸, Barnett writes:

"...manufacturers have introduced a variety of concepts for minimizing inadvertent activation arising from 'stepping contact.' For example, top barrier guards, side shields, pedal locks, and front gates are used in various combinations. Unfortunately, as the intervention strategies become increasingly successful preventing 'stepping contact,' the foot control becomes more prone to the really insidious problem of 'riding the pedal.'"

In another publication by Barnett and Hamilton, *Philosophical Aspects of Dangerous Safety Systems*⁹, December, 1982, the authors use a front-gated foot control as an example of a dangerous safety system. Originally intended to address the hazard of inadvertent foot switch actuation, the front gate resulted in encouraging the practice of riding the pedal due to the added difficulty of inserting one's foot into the pedal. In an effort to compensate for the difficulty associated with inserting one's foot into the pedal housing, the user simply held the front gate open continuously with the foot thereby riding the pedal at those times when the foot should otherwise be removed entirely from the foot control. Barnett and Hamilton wrote⁹:

"Recently completed research has confirmed what some press manufacturers hypothesized – the mousetrap design is unsafe for most punch press operations since it encourages the practice of 'riding the pedal'"

When a safety system offers an accident hazard potential of its own, there is unequivocal agreement in the safety literature against the use of the safety system. This safety philosophy is highlighted in the December, 1982 publication by Barnett and Hamilton. For example, the National Safety Council wrote in 1975⁹:

"It is a cardinal rule that safeguarding one hazard should not create an additional hazard."
[Handbook of Occupational Safety and Health]

Numerous other safety organizations and publication authors have written similar admonitions including:

- Occupational Safety Management and Engineering, Willie Hammer, 1981
- Concepts and Techniques of Machine Guarding, OSHA 3067, 1980
- Motor Operated Appliances, UL 73, Underwriters Laboratories, 1978

- Accident Prevention Manual for Training Programs, American Technical Society, 1975
- Code of Practice: Safeguarding of Machinery, British Standards Institution, 1975
- Machine Guarding, National Safety News, 1971
- General Requirements for All Machines, 29 CFR 1910.212(a)(2), OSHA, 1971
- Supervisors' Safety Manual, National Safety Council, 1970
- Industrial Safety, 3rd ed., Roland P. Blake, 1963
- Guards Illustrated, 1st ed., National Safety Council, 1962
- The Principals and Techniques of Mechanical Guarding, Bureau of Labor Statistics No. 197, U.S. Dept. of Labor, 1959
- Safety Manual for the Graphic Arts Industry, National Safety Council, 1953
- Model Code of Safety Regulations for Industrial Establishments for the Guidance of Governments and Industry, International Labour Office, 1949
- Mechanical Power transmission Apparatus, National Safety Council, 1949
- American Safety Standard Code for Power Presses and Foot and Hand Presses, ANSI B11.1-1948, American National Standards Institute, 1948
- Accident Prevention Manual for Industrial Operations, 1st ed., National Safety Council, 1946
- Occupational Accident Prevention, Judson and Brown, 1944
- Safety Subjects, Bulletin 67 of Division of Labor Standards, U.S. Dept. of Labor, 1944
- Foremanship and Safety, Macmillan, 1943
- Practical Safety Methods and Devices, Cowee, 1916

The undersigned was both a participant and proctor in the foot switch experiments conducted by Barnett in reaching the above-stated conclusion regarding the "riding the pedal" problem.

In February, 1988, Barnett and the undersigned co-authored a publication entitled, *Principles of Human Safety*¹⁰. The philosophical problem of how to treat safety devices which have a downside is considered. Individual designers and manufacturers should not adopt safety devices that create a new hazard. In those instances when a downside exists with the use of a safety device, a value system (for example, the judicial value system, safety standards committee, etc.) must weigh the upside and downside effect of the particular safeguarding system. If the upside effects are sufficiently compelling, permission is granted to use the safeguard. It is acceptable for an educated consensus group (value system) to make a decision about the use of a safety system that includes a downside, but it is not acceptable for an individual person or individual manufacturer to make a decision of this nature.

The seatbelt is a classic example of a safety device that includes downside effects which has been adopted by a value system and is required on all modern automobiles. The Food and Drug Administration is a classic example of a value system that routinely approves products that involve adverse side effects when the positive effects are judged to sufficiently outweigh the negative side effects.

No value system, i.e. no safety code or standard committee, to date, has made a judgment, recommendation or requirement that foot controls must include a front gate. Clearly, using the method outlined above for evaluating the proposed front gate for foot controls, the safety device must be rejected by an individual designer or product manufacturer due to the new hazard introduced (i.e. riding the pedal and the associated potential for inadvertent control actuation).

Further Evaluation of the Proposed Front Gate

In May, 1995, Barnett and Schmid published a paper entitled, *Safeguard Evaluation Protocol – A decision Tree for Standardizing, Optionalizing, Prohibiting, Ignoring, Enhancing, or Characterizing Safeguards*¹¹. The publication describes a protocol developed for assessing whether a candidate safeguard should be prohibited. Barnett and Schmid wrote:

“This decision making process intellectually disposes of the judicial position that a manufacturer has a nondelegable duty to include safety devices with his machines. It further challenges the advocacy pronouncement that ‘safety should not be optional.’”

Utilizing the Machine Supplier Safeguard Decision Tree described in the paper, the proposed safety feature is the front gate for a foot switch control. Next, it is noted that there is no Value System Approval for the proposed safeguard. Next the proposed safeguard must be classified with regard to helping, hurting and/or doing nothing. The foot control gate either helps (reduces the probability of inadvertent pedal actuations) or hurts (increases the potential for riding the pedal thereby increasing the probability of inadvertent actuation).

The decision tree is abundantly clear. The proposed safeguard must not be used.

Conclusions and Opinions

1. The Linemaster Hercules foot control exceeded the safety requirements of the governing safety standard, ANSI B11.3-1973 at the time the accident occurred. In addition to the top guard protecting the pedal from the required hazard of inadvertent actuation from falling objects or stepping onto the pedal, the Linemaster foot control was also equipped with side guards and a toe latch feature. The side guards and toe latch features further decrease the probability of inadvertent pedal actuation.
2. It is not possible to prevent someone from inadvertently stepping into the pedal when the intended use of the pedal involves stepping into it. This holds true for the proposed front gate. Its use is not a guarantee that an inadvertent actuation will not or cannot occur.

3. A top guard alone adequately addresses the ANSI B11.3 requirement of preventing inadvertent actuation due to stepping onto the pedal.
4. A foot control with top and side guard is illustrated in both the 1982 and 2002 revisions of the power press brake safety standard. This style of foot control is acceptable for selection by a reasonable machine tool manufacturer. Heim's choice of foot control, i.e. covered on the top and both sides) exceeded what was considered reasonably safe by the B11.3 safety code committee. The foot control in use at the time of the accident, i.e. with top and side guards and toe latch feature further exceeded the code requirement for protection against inadvertent actuation.
5. The addition of a lift gate onto the front of a foot control does not eliminate the probability of inadvertent actuation of the pedal.
6. The teathered cord feature of the electric foot control allows it to be utilized at a "Safe Distance" from the point of operation. It also allows for its use by a seated operator. The older mechanical foot pedal does not share either of these features. In addition, the electric foot control significantly reduces operator fatigue due to lower actuation forces and reduction of the need to stand balanced on one leg when compared to the older mechanical foot pedal.
7. The work being conducted by Ms. Lindquist at the time of her injury was compatible with either a mechanical foot pedal or an electric foot control. However, neither style of foot actuating means alone was adequate to protect Ms. Lindquist from the point of operation. Corry Manufacturing should have selected a two-hand control device of provided additional barrier guarding to prevent Ms. Lindquist from accessing the point of operation during the press brake operating cycle.
8. The anti-trip Linemaster footswitch product with latch trip lever in use at the time the accident occurred could not have been the foot control product supplied by Heim with the press brake in 1978. Heim did not begin to utilize the foot control with latch trip lever until late in 1982.
9. According to foot control research conducted by Barnett, the addition of a lift gate onto the front of a foot control creates a new hazard by encouraging the user to ride the pedal thereby increasing the potential for inadvertent actuation.
10. An individual manufacturer such as Heim has a responsibility to reject safeguards which create new hazards such as the proposed lift gate on a foot control.
11. There is unequivocal agreement in the safety literature against the use of safeguards that create a new hazard.
12. No value system has weighed the upside and downside effects of the proposed foot control lift gate and found the upside effects to be sufficiently compelling to grant permission to use the safeguard or to make its use mandatory.

13. Utilizing the *Safeguard Evaluation Protocol* published by Barnett and Schmid, the proposed lift gate feature for foot controls must be rejected.
14. The presence of a lift gate on a foot control has no effect on the misuse of riding the pedal since an operator who is committing this unsafe act has already bypassed the lift gate through failing to remove the foot after each pedal actuation. There is no foot control or foot pedal design that prevents the misuse of riding-the-pedal.
15. The foot control in use at the time of Ms. Lindquist's accident was reasonably safe for its intended use on the Heim press brake.

All of my opinions outlined above are stated to within a reasonable degree of engineering and scientific certainty.

Future Consulting Activities

The undersigned reserves the right to amend this report in the event additional information becomes available. For example, it is anticipated that a copy of the videotaped foot control testing by Barnett and Ulmenstine will be supplied. Commentary and opinions regarding this information will be forthcoming after the tests are reviewed.

Very truly yours
Switalski Engineering Inc.

William G. Switalski

William G. Switalski, P.E.
Mechanical Engineering Safety & Design Consultant